

RAP4

**The Official Rap4 User's Guide
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AN INTRODUCTION TO RAP4

WHAT IS RAP4?

RAP4 is a complete sound sampling, playback, editing and sequencer package for the Commodore Plus/4 computer. "Sampling" is the process by which any sound may be converted to a format understandable by computer, namely a set of numbers. In this form, the sound may be played back at different speeds, altered, reversed, played like a musical instrument, or sequenced into a melody. RAP4 provides all these features and includes many which until now have only been available on far more powerful 16-bit computers.

RAP4 is unique in several respects. Firstly, at the time of writing, it is the only commercial sound synthesis package available for the Plus/4 computer, and secondly, it uses a WIMP graphical control interface of the type found on such computers as the Commodore Amiga™ and Atari ST™. Instead of using commands and complex keystrokes, RAP4 uses just the cursor keys, a joystick, or a mouse for all its functions. Every function of RAP4 is operated in a consistent manner so that within a few minutes the user should be able to control every single feature to the full. Although RAP4 incorporates some powerful operations, the simplicity of use makes the program fun to use.

LOADING THE RAP4 EDITOR

The RAP4 package consists of two programs contained on a single 5.25" disk - the "Editor" and "RAP4 BASIC". The Editor is where sampling is performed and where all of the work goes on. RAP4 BASIC allows you to use sounds and melodies in your own BASIC programs. To load either of the programs, simply switch on your computer, insert the RAP4 disk in your disk-drive and press <SHIFT>-<RUN/STOP>. After a few seconds, a menu will appear with two options. To load the Editor, simply press key "1", or to load RAP4 BASIC, press key "2". On pressing a key, the menu option will flash, the disk-drive will whirr again, and your chosen program will be loaded and run automatically.

CHAPTER 2

STARTING TO USE THE RAP4 EDITOR

THE RAP4 MAIN SCREEN

When you have run the RAP4 Editor program from the disk menu, the screen will display a grey desktop with copyright message, arrow-shaped pointer and row of phrases on the top line of the screen. There are two important elements to the control of RAP4 - the pointer and menu bar. There are three methods of controlling the pointer - keyboard, joystick in port 2, or mouse. Keyboard control is by the cursor-key cluster at the bottom-right of your Plus/4, using the <RETURN> key instead of the joystick fire-button. If you wish to use a mouse, any mouse which can emulate a joystick may be used. These include Datel Electronics' mouse and Commodore's 1351 mouse. The pointer can be moved around the whole of the screen and will adapt to the different graphics underneath it. The <RETURN> key or fire-button is used for selecting choices or options.

RAP4 is organised as a number of individual screens, each of which has a specific purpose. All of these screens are accessed using the "menu-bar" at the head of the main screen. When you click on one of the titles in the menu-bar (move onto that option and press <RETURN> or the fire-button) a menu will drop down with several options, one highlighted. To select one, just use Up and Down to highlight it and then push your select button. To leave the menu, select the "Exit" option. From the main screen, each menu option is the name of one of RAP4's other screens. When you are using another screen, the menu bar is replaced by the title of the current screen and serves no other purpose.

THE POINTER SPEED SETUP SCREEN

The Pointer Speed screen is opened by selecting the SPEED option on the SYSTEM menu. When you select this option, the screen will clear, a title bar will be shown at the top of the screen, and several objects will appear on the screen.

At the top of the screen is a "Window". This is simply a rectangular box which displays information on-screen. On the Pointer screen, the window shows the current speed setting of pointer movement as a bar-graph - the longer the bar, the faster the movement.

Below the window are three "Buttons". Buttons are used throughout RAP4 as the means of actually performing actions. There are several types of buttons. The "Redefine" and "Quit" buttons are simple action buttons. If you click on this type of button, an action will immediately be carried out. The "Speed" button is divided into two sections and is a setup button. You can select either in the "-" section or "+" section to change a setting of some option, here the speed, but nothing actually happens until an action button is selected.

To change the speed of pointer movement, click on the "-" and "+" buttons to decrease or increase the setting.

The Pointer Speed Setup Screen (Cont..)

Note that the actual speed of movement will not change, but the bar-graph will grow and diminish. When you are happy with the setting, click on "Redefine" to set up the change. Try out the new speed and adjust it to your preferred value. You can then click on the "Quit" button to return to the main menu. These operations are summarized in the Command Summary shown below. This lists the windows and buttons on each screen along with the location as vertical and horizontal positions and the object's function.

Window	Location	Function
Pointer Speed	Top-Centre	Shows pointer movement speed
Button		
- Speed +	Centre-Left	+/- pointer speed
Redefine	Centre-Centre	Locks in change to speed
Quit	Centre-Right	Returns to main screen.

Command summaries of this type provide a concise breakdown of a screen's functions. Throughout this manual you will find a command summary for each screen and instead of longhand explanations, a brief description of each of the screen's functions and uses. This layout should allow you to learn to use RAP4 quickly and confidently, and also keeps the manual concise, one of the aspects which has kept the price of RAP4 low. Where functions are obvious, descriptions have been kept short, but be sure that the complex functions are completely documented.

CHAPTER 3

CREATING A SAMPLE

THE SETUP SAMPLE DATA SCREEN

The Sample Data screen is accessed using the SETUP option of the EDITOR menu. Its command summary is as follows.

Window	Location	Function
"Use With Care"	Top-Left	Shows warning to take care
Sample Selection	Top-Right	Selection of current sample
Sample Information	Centre-Left	Shows sample information

Button	Location	Function
<- Start ->	Bottom-Left	+/- sample start address
<- End ->	Bottom-Left	+/- sample end address
Name	Bottom-Right	Entry of sample names
Hi/Lo <-->	Bottom-Right	Alteration of high/low byte
Redefine	Bottom-Left	Locks in current settings
Quit	Bottom-Left	Returns to main screen

The Sample Data screen is used to set up information about samples prior to recording them. RAP4 allows up to eight samples to be stored in memory at a time, sharing the 64k RAM of the Plus/4. This screen should be used with care as you cannot undo changes you make, so a graphic warning window is displayed. In the top-right of the screen is the Sample Selection window which is found on almost all of RAP4's screens. This window is a combination of window and button. To choose a sample, number 0 to 7, click on the sample name or number in the window, and that sample will highlight. The information about the current sample is shown in the Sample Information window. NAME shows the name of this sample. START and END show the start and end addresses of the area of memory the sample will occupy. You can change the addresses using the appropriate "<-" and "->" buttons, and you are automatically limited to the valid address range. The High/Low button is a toggle-button which selects whether the addresses are incremented and decremented in steps of 1 (LOW) or 256 (HI). To toggle between these, click on the "<-->" section. The NAME button opens a new window displaying a prompt and flashing "I-Bar" cursor. You can type a new name, use to delete, and enter it by pushing <RETURN>.

When you have made any alterations you want to the current sample attributes, click on the REDEFINE button to lock in the changes. You can repeat this for each sample, and click on QUIT to return to the main screen.

THE AUDIO MONITOR SCREEN

For reasons of economics, RAP4 uses your standard Commodore Datasette cassette-recorder for audio input. In order to digitise a sound and use it on your Plus/4, all you need do is record it on a standard audio cassette.

The Audio Monitor Screen (Cont..)

When you have a suitable sound on tape (use a music cassette if you have not recorded a sound), place the cassette in your Datasette and enter the Audio Monitor screen. The screen is opened by selecting the MONITOR option on the SAMPLER menu.

Window	Location	Function
Audio Level	Top-Left	Displays level of audio input
Button	Location	Function
Monitor	Top-Left	Activates the audio monitor
Quit	Top-Centre	Returns to main screen

The Monitor screen is used to position your tape at the right place for sample recording. In order to move the tape to the right place, click on the MONITOR button and press <PLAY> on your Datasette. The pointer will disappear and the audio on your cassette is relayed through your Plus/4 to your television or monitor - turn up the volume to make sure you can hear it! The audio is also displayed in the Audio Input window as a bar graph. Use the <Rewind> and <F.Fwd> buttons on your Datasette to position your tape, then push <STOP> and the pointer will re-appear on-screen. If you like, reset or make a note of the counter reading on your Datasette so that you can easily relocate the sound. When you are happy with the position, click on QUIT to return to the main screen.

THE SOUND SAMPLER SCREEN

The Sound Sampler screen is the heart of the RAF4 system and is used for actually recording and playing-back sampled sounds. The screens command summary is shown here.

Window	Location	Function
Record Speed	Top-Left	Shows sample recording speed
Play Speed	Top-Left	Shows sample playback speed
Sample Selection	Top-Right	Selection of current sample
Sample Location	Centre-Left	Shows the sample's memory area
Button	Location	Function
Record +/-	Top-Centre	+/- Sample recording speed
Play +/-	Top-Centre	+/- Sample playback speed
Record	Centre-Left	Activates recording of sample
Play-Back	Centre-Left	Activates playback of sample
Redefine	Centre-Right	Locks in changes to speeds
Quit	Centre-Right	Returns to main screen

Using the Sound Sampler screen, you can record audio from cassette into any of the eight samples you have set up. You can select which sample to record using the Sample Selection window, and the memory occupied by this sample will be shown on-screen. Also associated with each sample is a pair of speeds - record and playback. Recording of a sound can be carried out at 256 different speeds numbered \$00-\$FF.

The Sound Sampler Screen (Cont..)

If you use a very high speed, the quality of the sample recorded will be very high but the sample will consume memory very quickly. If you use a slower speed, the sound quality may suffer, but the sound will not need as much memory. You should experiment and select a recording speed to suit individual sounds. When you play the sample back, you will normally use the same speed as that used for recording it, but you can if you wish change the playback speed to produce effects such as decreasing the pitch of an instrument sample or making a recorded voice sound comic and squeaky, by increasing the speed. So that each time you use the sampler you don't have to keep on resetting the speeds, you can lock them to the current sample by clicking on REDEFINE.

Having set up the sample number and speeds, click on RECORD. A window will appear telling you to press <PLAY> on your Datasette. When you do so, the screen will go blank and recording of the sample will begin. When this is finished, the screen will return to normal. To play back the sample, just click on PLAY and enjoy! To return to the main screen, click on QUIT.

CHAPTER 4

SAMPLE ALTERATION & EDITING

THE REVERSE SAMPLE SCREEN

The real power of computer sampling is the ability to alter sounds in a way which is just impossible using conventional recording methods. The first of these effects is "Reverse" and is performed using the Reverse Sample screen.

Window	Location	Function
Sample Location	Top-Left	Shows sample memory area
Sample Selection	Top-Right	Selection of current sample
Buttons	Location	Function
Rev. (Reverse)	Centre-Left	Reverses current sample data
Play	Centre-Left	Plays back current sample
Quit	Centre-Centre	Returns to main screen

The Reverse screen has one simple function - to reverse the data of a sample in memory so that when played it plays backwards. The screen features the familiar sample selection window which is used to select the sample to be reversed, the sample location window, and three buttons. The REV button reverses the current highlighted sample. PLAY plays the current sample back, and QUIT returns to the main screen. To reverse a sample, click on REV, and to return it to normal click on REV again.

THE SAMPLE EDITOR SCREEN

The Sample Editor found in the RAP4 package is arguably its most powerful feature, and is one which is found in very few sound packages for any 8-bit computer. The Sample Editor screen is opened by selecting EDITOR from the EDITOR menu. The Command Summary is as follows.

Window	Location	Function
Waveform	Top-Left	Shows sample waveform section
Sample Selection	Top-Right	Selection of current sample
Edit Information	Centre-Right	Shows editing information
Button	Location	Function
<- Move ->	Centre-Left	Moves edit cursor up/down
- Amp +	Centre-Centre	+/- Amplitude of byte
Start	Bottom-Left	Sets Start marker
End	Bottom-Left	Sets End marker
Play	Bottom-Centre	Plays current marked section
Redefine	Bottom-Right	Locks in changes to Start/End
Quit	Bottom-Right	Returns to main screen

The Sample Editor Screen (Cont..)

As you can see, this is quite a complex screen. Any of the eight samples in memory may be edited by selecting a sample in the Sample Selection window. When a sample is selected, the data for that sample is converted into a graph of amplitude and displayed in the window marked "Amplitude Waveform". Each byte of data is shown as a vertical bar 0-7 units high. In this window are three single arrows. In the centre of the dotted line is a vertical arrow, the Edit Cursor. This indicates the byte which will be affected by the AMP button. The address of this byte and its amplitude is shown in the Edit Information window. The two horizontal arrows at either end of the dotted line indicate in which directions movement through the sample is possible. When editing begins, the edit cursor is positioned at the beginning of the sample, so movement is possible to the right (up) only. When at the end of a sample, movement is possible left (down) only, so the arrows point left, and part way through a sample, the arrows point in either direction.

To move forwards and backwards through a sample, click on the appropriate ends of the MOVE button. The graph display will scroll to reveal the next section of the sample waveform. To change the amplitude of a byte, click on either end of the AMP button. The amplitude will increase or decrease and the graph will change accordingly.

While you are editing a sample, it is likely that you will want to hear some sections only of the sample. This can be done by moving to the desired start byte, clicking on START then moving to the desired end byte and clicking on END. The start byte of the section is indicated in the Waveform window by a double-arrow ">>" symbol, and the end by a double-arrow "<<" symbol. To play the section of sample between the markers, click on the PLAY button. If you wish to store the start and end markers as the default for the current sample, click on REDEFINE. This is especially useful for cutting off unwanted sections of a sample, or isolating elements of the sample, for example a certain word or a section of an instrument's waveform.

It is important to remember that unlike other of RAP4's features, editing of a sample cannot be undone - any changes you make are permanent until the sample is re-recorded. For this reason, the editor should be used carefully. When you are done, click on the QUIT button to return to the main screen.

CHAPTER 5

THE SYNTHESIZER & SEQUENCER

Although it is fun, and in many applications enough to play recorded samples "as-is", effective use of sampled sounds can be made by using sampled sounds as musical instruments, not as complete tunes or sound effects. This is one of the principles of sound on the Commodore Amiga computer, and for anyone who has used one of these machines, the results should speak for themselves. RAP4's synthesizer and drumkit functions allow you to use your Plus/4 keyboard as a real-time monophonic digital synthesizer, create melodies or rhythm tracks using RAP4's built-in sequencer and play these back automatically under program control.

THE SETUP KEYBOARD NOTES SCREEN

The Keyboard Setup screen is used to set up notes on the Plus/4's keyboard ready for use as a synthesizer keyboard. The screen is accessed using the NOTES option on the SYNTH. menu. The Command Summary is shown below.

Window	Location	Function
Key Information	Top-Left	Selection & Display of keys
Sample Selection	Top-Right	Selection of current sample
Button	Location	Function
- Frequency +	Bottom-Left	+/- Frequency of current key
Play Note	Bottom-Centre	Plays note of current key
Quit	Bottom-Right	Returns to main screen

The RAP4 synthesizer is monophonic in that it can only play one note at a time, and in that each key on the keyboard plays notes using the same sample. The synthesizer plays a musical octave of notes, or 12 notes. However, because each key can be set for any frequency, you are not limited to just an octave in frequency range, and your keyboard does not even have to be chromatic - make it however suits you best.

The Sample Selection window allows you to select the sample which will be used when playing the synthesizer keyboard. The Key Information window shows information about each of RAP4's synthesizer keys. In the left column is the name of the key on the Plus/4 keyboard, arranged like a piano keyboard. In the centre column is the recommended note to be played by that key, and in the right column is the frequency for which the key is currently set up. The frequency of the note each key will play is expressed as the playback speed of the sample as on the sampler screen. To change the current key, click on its line in the Key Information window. To hear the note assigned to the current key, you can click on the PLAY NOTE button, and you can alter the frequency of the current note by clicking on the appropriate sections of the FREQUENCY button. When you are happy with the setup of the keys, click on QUIT to return to the main screen.

THE DIGITAL SYNTHESIZER SCREEN

The Digital Synthesizer screen is used for playing RAP4's synthesizer on your Plus/4 keyboard. To enter the screen, select the SYNTH. option in the SYNTH. menu. The Command Summary is as follows.

Window	Location	Function
Key Information	Top-Left	Shows current keyboard setup
Sample Selection	Top-Right	Selection of synthesizer sample
Keyboard Display	Bottom-Right	Shows keyboard layout

Button	Location	Function
Synthesizer	Bottom-Left	Activates the synthesizer keys
Quit	Bottom-Centre	Returns to main screen

Because the RAP4 synthesizer is played using your Plus/4 keyboard, the functions of the Synthesizer screen are minimal. The Sample Selection window lets you choose the sample to be played by the synthesizer keyboard. The Key Information window simply reminds you of the current keyboard setup. The Keyboard Display reminds you which keys on your computer keyboard to use to play the synthesizer. To enable the synthesizer keys, click on the SYNTHESIZER button. A message will appear in the keyboard display window, and the pointer will disappear. At this point you can play away on your keyboard to your hearts content. When you are finished, press the <ESC> key to return to pointer mode, and click on QUIT to return to the main menu.

THE SETUP DRUMKIT DRUMS SCREEN

In addition to a single-sample synthesizer, RAP4 also offers a monophonic, poly-sample drumkit facility. This feature is like the RAP4 synthesizer but you are not limited to a single sample on the keyboard. Eight keys can be set up to play any of eight samples at any frequency. This feature allows drumkit or "scratching" type effects to be generated. The Setup Drumkit Keys screen is used to set up the drumkit as for the Synthesizer.

Window	Location	Function
Drum Information	Top-Left	Shows current drumkit setup

Button	Location	Function
- Sample +	Centre-Left	+/- drum sample number
- Frequency +	Centre-Centre	+/- sample playback frequency
Play Drum	Bottom-Left	Plays current drum
Quit	Bottom-Centre	Returns to main screen

The drumkit setup screen is similar to the synthesizer setup screen except that each key can now be set up with a sample number as well as frequency. The drum information window shows the key which plays the drum, the sample that drum will use and the playback frequency of that sample. The drum whose attributes are to be altered is selected by clicking on its line in the window.

The Setup Drumkit Drums Screen (Cont..)

The sample number and playback frequency can then be increased and decreased by clicking on the appropriate side of the SAMPLE and FREQUENCY buttons. To hear the current drum you can click on the PLAY DRUM button, and to return to the main screen, click on QUIT.

THE DIGITAL DRUMKIT SCREEN

When you have set up your desired drumkit, the Drumkit screen is opened to play the drumkit. This is done by selecting the DRUMKIT option on the SYNTH. menu.

Window	Location	Function
Drum Information	Top-Left	Shows current drumkit setup
Drum Display	Top-Right	Shows drumkit layout

Buttons	Location	Function
Drumkit	Centre-Left	Activates the drumkit keys
Quit .	Centre-Centre	Returns to main screen

The Drum Information window serves as a reminder of the current setup of the drumkit, and the Drum Display window shows the layout of keys on the Plus/4 keyboard which play the drums. To activate the drumkit, click on the DRUMKIT button. On doing this, the pointer will disappear and the drumkit keys will play their different sounds. You can exit by pressing the <ESC> key, and return to the main screen by selecting QUIT.

THE MELODY SEQUENCER SCREEN

The Synthesizer and Drumkit screens of RAP4 allow for realtime playing of samples on the Plus/4 as if it were a standard synthesizer. The Melody Sequencer takes this one step further and allows melodies to be composed and stored in memory, made up of drums and synthesizer notes. These melodies can be edited at leisure and then played back automatically under complete computer control. In the SEQUENCER menu on the main screen you will find three options. The first - NOTES and DRUMS are duplicates of those in the SYNTH. menu and are described earlier. To open the sequencer screen, select the SEQUENCER option. The Command Summary for the screen is shown below.

Window	Location	Function
Melody Editing	Top-Left	Editing of melody data
Sample Selection	Top-Right	Selection of synthesizer sample
Drum/Note Entry	Bottom-Right	Entry of drums/notes in melody

Button	Location	Function
(- MOVE -)	Centre-Left	Moves <> through melody
Silence	Centre-Centre	Enters silent pause in melody
Replay	Bottom-Left	Plays back melody
Finish	Bottom-Left	Returns to main screen

The Melody Sequencer Screen (Cont..)

The Sample Selection window is used as in the synthesizer for selecting which sample synthesizer notes should be played on. At the head of the screen is the Melody Editing window where the actual editing of melodies is carried out. Melodies are displayed using semi-standard musical notation, on a set of four staves in this window. At the bottom of the window is a vertical arrow which indicates the current byte to be edited, and at the sides are two movement arrows which work in the same way as those in the Sample Editor. Notes are shown on the staves in three ways: A solid circle indicates a white key on the synthesizer, that is, a natural note. A circle with a sharp symbol within represents a black key on the synthesizer. The synthesizer notes are positioned as on standard musical staves with key "D" being middle-C and key "L" being B-natural. Drum keys are shown on the staves as a grey, fuzzy circle. Drum "T" is above the top staff, and drum "N" is on the lowest. If you are unfamiliar with simple musical notation, the principle is that the higher the note on the keyboard, the higher its position on the staves.

To enter a note onto the staves, simply click on the picture of the key or drum you wish to enter, for example, to enter drum "U" move onto the "U" in the drumkit and press your select key. The drum will sound and its symbol be displayed on the staves. The display window shows 16 notes at a time and thereafter scrolls to fit the new note on. To enter a period of silence into your melody, just click on the SILENCE button. This appears as a blank period on the staves. To move forwards and backwards through your melody, click on the appropriate side of the MOVE button. A maximum of 128 notes can be entered and stored.

When you are done entering notes, the melody can be replayed by clicking on the REPLAY button. You can try out different samples by clicking in the Sample Selection window. When you are finished, clicking on FINISH will return you to the main screen.

DATA DELETION & STORAGE

ERASING SAMPLES & MELODIES

While you are using RAP4 for sample and melody creation, you may at times wish to clean up memory by erasing samples, and resetting your melody ready to start afresh. Two screens are used for these purposes.

THE ERASE SAMPLE DATA SCREEN

The Erase Sample Data screen is used to clear the memory used by a sample by resetting all the bytes in that area to zero. The screen is accessed using the ERASE option in the EDITOR menu. The Command Summary for this screen is as follows.

Window	Location	Function
"Erase Destroys..."	Top-Left	Displays a "no-undo" warning
Sample Selection	Top-Right	Selection of sample to erase
Buttons	Location	Function
Erase	Top-Left	Erases current sample
Quit	Top-Left	Returns to main screen

To erase a sample, highlight it in the Sample Selection window and click on the ERASE button. A small window will appear under the pair of buttons displaying the message "Erasing..." and after a few seconds, the sample will be erased. Note that the graphic warning message displayed on-screen is well-advised - When you click on the erase button, you pass the "point of no return".

Clicking on the QUIT button returns control to the main screen.

THE CLEAR MELODY DATA SCREEN

The Clear Melody Data screen is used for erasing melodies. It is opened using the CLEAR option of the SEQUENCER menu. On entry, the screen shows one window and two buttons:-

Window	Location	Function
"Clear Destroys..."	Top-Left	Displays a "no-undo" warning
Button	Location	Function
Clear	Top-Left	Clears current melody
Quit	Top-Left	Returns to main screen

The CLEAR button completely erases your current melody - again, there is no regaining the data once it has been cleared, so use with care. To return to the main menu, click on QUIT.

SAVING YOUR WORK - THE DATA STORAGE SCREEN

The Data Storage screen allows you to load and save RAP4 data onto tape or disk. The screen allows the storage of data for later use and for import into RAP4 BASIC programs. All types of data may be saved including samples, synthesizer/drumkit setups and melodies. RAP4 also features a superlatively fast tape system which allows the saving of data onto tape at an incredible 2340-baud. The Command Summary is shown below.

Window	Location	Function
"Load May Delete..."	Top-Left	Warns that LOAD may delete data
Sample Selection	Top-Right	Selection of sample to be saved

Button	Location	Function
Save/Load Sample	Top-Left	Saves/Loads a sample
Save/Load Synth.	Centre-Left	Saves/Loads a synth./drum setup
Save/Load Melody	Bottom-Left	Saves/Loads a melody
Disk/Tape <-->	Bottom-Right	Toggles between disk/tape use
Directory	Bottom-Left	Displays disk directory screen
Quit	Bottom-Right	Returns to main screen

In fact, the Data Storage screen is made up of two screens, the second of which is called up by the Directory button. The Sample Selection window is used to select which sample to save. When loading, samples automatically load into their original position. The DISK/TAPE toggle button is used to select whether data storage is to be carried out using disk or tape systems.

To obtain a list of files on the disk in your disk-drive, you can click on the DIRECTORY button. A new screen opens with a large window and two buttons. The disk directory will be displayed in the large window. To slow down the display, hold down the Commodore (C=) key, or to halt it, push <CTRL>-<S>. When the directory finishes, you can repeat it by clicking on the REPEAT button, or to return to the main Data Storage screen, click on RETURN.

Saving & Loading Data On Disk

To save a sample to disk, simply highlight it in the Sample Selection window and click on SAVE Sample. A window with the message "Saving..." will appear and the sample will be saved.

To save a synthesizer/drumkit setup or melody, click on the appropriate SAVE button. A window will open asking for a filename. Enter a name for the data and push <RETURN>. The "Saving..." window will appear and the data will be saved.

To reload a sample, synthesizer/drumkit setup, or melody, just click on the appropriate LOAD button. A window will appear again asking you for the filename. Enter a name and push <RETURN>. A window will open displaying the message "Searching...". If the file is found, the message will change to "Loading..." and the data will be reloaded.

Saving & Loading Data On Disk (Cont..)

If while saving or loading RAP4 data on disk an error occurs, a new window will appear displaying the error message, accompanied by a button marked OK. To acknowledge the error and abort the load, click on OK or QUIT. The error displayed will be one of three types: The error "ILLEGAL FILE TYPE" indicates that the file selected during loading was not a real RAP4 file. A disk error is shown as "NN, ERROR MESSAGE, NN, NN" and these can be found on page 176 of your Plus/4 manual. Input/Output errors are shown as "OPERATING SYSTEM ERROR \$NN" and are as for TEDMON.

Saving & Loading Data On Tape

The method for saving RAP4 data on tape is almost identical as that for saving data on disk. Before the "Saving..." window appears however, the procedure is as follows: A window will appear telling you to "Wind tape and press Stop". Insert a blank tape in your Datasette and position the tape using <F.Fwd> and <Rewind>. When you have done this, press <Stop>. The message will change, telling you to press <Record> on your Datasette. When you do this, the "Saving..." window will appear, the screen will change to a pattern of blue and white stripes, and your data will be saved.

When loading data from tape you do not need to specify a filename as for disk. Just click on LOAD, position your tape and press <Play> on your Datasette as requested on-screen. The message displayed will say "Searching...". when a file is found, the message will change to "FOUND <SAMPLE/SYNTH./MELODY> <filename>". If the file is genuine RAP4 data, the "FOUND" will be replaced by "LOAD?", the tape will stop and two extra buttons will appear marked YES and NO. If you wish to load this file, click on YES and the data will be loaded. If you don't, click on NO. If you wish to abort the load process, click on the QUIT button.

CHAPTER 7

LEAVING RAP4 & RECOVERING FROM MISTAKES

THE ABORT PROGRAM SCREEN

When you have finished using RAP4, you can select the ABORT function from the SYSTEM menu to exit to BASIC. The Abort Screen screen displays a warning message and features just two buttons. To return to the main screen, click on QUIT, or to exit unto oblivion, select ABORT.

RECOVERING FROM MISTAKES

It is inevitable that at some time while using the RAP4 Editor, you will do something you didn't mean to do. Examples of this are playing a full memory sample at a playback speed of zero which results in five minutes and three seconds of boredom, or trying to load a cassette file that doesn't exist. You can however easily recover from all these situations leaving your data intact. This is done in the following way:-

While holding down the <RUN/STOP> key, push the Reset button on the right-hand side of your Plus/4. This as usual puts you into the machine-code TEDMON monitor. To get back into RAP4, simply press the HELP button (right-most function key). This returns you to the main RAP4 screen, leaving all your sample data etc. unaffected.

That ends the first part of the manual, on the RAP4 Editor. The second section covers RAP4's other component - RAP4 BASIC.

INTRODUCING RAP4 BASIC

So that you can easily use the sounds and melodies you have created using the RAP4 Editor in your own programs, a special extension to the normal Plus/4 BASIC has been included in the RAP4 package. The system has been written in accordance with the design of the Editor, making the new commands very easy to use, being close to spoken English, so even someone who has very little experience of BASIC should find the commands simple to use.

LOADING RAP4 BASIC

RAP4 BASIC is loaded in an identical way to the RAP4 Editor - Push <SHIFT>-<RUN/STOP> to load the RAP4 menu then push key "2". The menu option will flash and BASIC will load, displaying a start-up copyright message on the screen, followed by the usual READY. prompt. At this point, there are five new commands available. The use of these commands is explained here.

PUNCTUATING RAP4 COMMANDS

All of RAP4's commands take a standard syntax like that of Commodore BASIC. The format of each command is shown in the form of a Command Template. The template for the LOAD command is shown below:-

```
LOAD [SAMPLE/SYNTH/MELODY] "<FILE-NAME>" (USING [TAPE/DISK])
```

The notation for such a template is as follows: The first word is the actual command. Arguments within square brackets "[]" are arguments that are obligatory - they must be entered. Arguments within parentheses "()" are voluntary arguments which do not have to be entered. Text in angle brackets "<>" should be replaced by text for the argument, for example "<FILE-NAME>" might become "SAMPLE.NAME". Where there are a limited number of alternatives for an argument, these are separated using slash "/" characters. In addition, there are two extra things to remember about RAP4 commands. When you are entering a command in direct mode, not as part of a program, or are using a command after a THEN or :ELSE statement, you must precede the command by a COLON, for example "LOAD" becomes ":LOAD".

Note also that any RAP4 argument may be replaced by any valid expression - "FILENAME" can be replaced by 'N\$' or '234' can be replaced by 'N%' or '200+34'. Additionally, standard commands such as the standard LOAD command can still be used as normal. RAP4 BASIC will test whether the command is a RAP4 implementation or a standard command, and will re-route the command to the appropriate code. Thus 'LOAD "program",8,1' will load a standard program whereas 'LOAD SAMPLE "sample"' will load a sample. In order to make remembering the commands easier, all are close to normal English, and the word "USING" can also be replaced by "ON", or "FROM" whichever seems more logical. All of the RAP4 commands give standard error messages which can be found in your Plus/4 manual.

THE RAP4 BASIC COMMANDS

THE LOAD COMMAND

LOAD [SAMPLE/SYNTH/MELODY] "<filename>" (USING [TAPE/DISK])

The template for the LOAD command is shown above. The LOAD command forms the heart of RAP4 BASIC and is used for importing data saved from within the RAP4 Editor. The command is used for loading samples, synthesizer/drumkit setups or melodies from tape or disk. By default, the command uses disk for loading, but you can set this by adding a "USING TAPE/DISK" argument. Note that after the first LOAD from tape or disk, all subsequent LOADs will use the last used device.

Examples:

:LOAD SAMPLE "sound" FROM DISK - Loads a sample called "sound" from disk

:LOAD MELODY "melody" - Loads a melody from the last used device

Tape & Disk Loading Procedure

When loading data from tape, the procedure is as follows: The message "Press play on tape" is displayed. When you push the <Play> button on your Datasette, the message "Searching..." is displayed. When a file is found on the tape, the message "Found <Sample/Synth/Melody> 'FileName'" is displayed. If the file is the one you specified, the message "Loading..." is displayed and the data is loaded. If the file is not the same as the one you specified, the process repeats until the right file is found.

When loading data from disk, the drive is searched for the file you specify, and if found, the message "Loading..." is displayed and the data is loaded. If a disk error occurs, it is indicated in the standard DS and DS\$ variables. To find the error, use 'PRINT DS\$'.

THE SOUND COMMAND

SOUND SAMPLE <sample number 0-7> (USING SPEED <speed 0-255>)
NOTE "<key letter>" (USING SAMPLE <sample number 0-7>)
DRUM "<key letter>"
MELODY (USING SAMPLE <sample number 0-7>)

The SOUND command is used to play all of RAP4's different sound elements - samples, synthesizer notes, drumkit drums or melodies. Three different syntaxes are available, one for each type of sound. When playing notes or melodies, if the sample number is not specified, the default sample is used (See DEFAULT). When playing samples, if no playback speed is specified, the speed locked to that sample in the Editor is used. For playing notes and drums, the sound is referred to by the key on the Plus/4 keyboard which plays that sound in the RAP4 Editor.

Sample numbers are in the range 0-7 and playback speeds in the range 0-255, as in the RAP4 Editor.

Examples:

:SOUND SAMPLE 0 USING SPEED 200 - Play sample 0 at speed 200
:SOUND MELODY ON SAMPLE 2 - Play the current melody using sample 2
10 SOUND NOTE "R" ON SAMPLE 5 - Play the note on key "R" using sample 5
100 SOUND DRUM "T" - Play drum "T"

THE DEFAULT SAMPLE COMMAND

DEFAULT SAMPLE <sample number>

The DEFAULT command is used to set up the sample which will be used for playing synthesizer notes or melodies with the SOUND command when it is not explicitly stated in the SOUND command.

Examples:

10 DEFAULT SAMPLE 7
20 SOUND MELODY - Play current melody using default sample 7
:DEFAULT SAMPLE N% - Set up default sample as the number in N%

THE LIST INFO COMMAND

LIST INFO (USING [SCREEN/PRINTER])

The LIST command is used to display some useful information about the current set of samples etc. which have been loaded into memory for use in your programs. The command will print a comprehensive list of information on either your computer screen or on a Commodore-standard printer connected as device 4 to the serial bus. You can specify which device to use by adding 'USING SCREEN/PRINTER'. If you omit this argument, the Screen is used as default.

When you run the LIST command on the screen, the screen is divided into two sections top and bottom. At the top are seven headings labelled by a hash, "SAMPLE NAME", "START", "END", "REC" and "PLAY". The hash refers to the number of the sample displayed on that line of the screen. SAMPLE NAME is the name of that sample. START is the sample's start address. END is the sample's end address. REC is the speed at which the sample was recorded, and PLAY is the default playback speed attached to the sample. Below this information is another line of titles labelled "NOTE", "FRO", "NOTE", "FRO", "DRUM", "SMP" and "FRO". From left to right they are: The key on which a synthesizer note is played, and its frequency or playback speed. There are two columns of information about the synthesizer keyboard, and on the right is a column of information about the drumkit - The key on which that drum is played, its sample number and its frequency. Under the headings are the six and eight rows of synthesizer data.

Finally, at the bottom of the screen or print-out is the default sample number, displayed at the bottom-left of the listing.

Examples:

:LIST INFO - List information on the screen
:LIST INFO ON PRINTER - List information on the printer

THE HELP COMMAND

HELP RAP4 /LOAD/ROUND/DEFAULT /LIST

At some time when using RAP4 you are bound to forget how to use some of RAP4 commands, or even the commands themselves. RAP4's final command is an extended HELP command which will display useful information about any of RAP4's commands. HELP RAP4 displays the initial copyright message and shows which commands help is available on. The other arguments display a short summary of the use of each RAP4 command, showing the command template and description of the commands function.

Examples:

:HELP RAP4 - Displays copyright message and information on
 available help
:HELP DEFAULT - Displays command template and information on the
 DEFAULT command

RAP4 CREDITS & ACKNOWLEDGEMENTS

PROGRAM & DEVELOPMENT CREDITS

The RAP4 program was designed and programmed in 1988 by Mark Everingham of Intellect Software. This 2nd Edition manual was written in October of 1989 by Mark Everingham.

The 2nd release of the RAP4 package was produced using WordPerfect V4.17, NotePad V2.2 and DeluxePaint III running on an Amiga A500. The original release was produced using just a Plus/4 and a lot of ingenuity - a testament to this excellent machine.

Thanks go to John Everingham who designed the original TTL4 interface and provided technical research. Thanks also to Paul Dias for development work on the 1st release, and for proof-reading the original manual. His graphic ideas, comments on style and frank criticisms have been invaluable.

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IN CONCLUSION...

That brings to an end this tutorial manual. Although reasonably brief, I hope that the information presented in this manual is quite sufficient to get any reader sampling and incorporating samples in his or her own programs. Any queries, complaints, requests for help or advice on any Plus/4 matter should be addressed to the address shown below. If writing on any matter other than RAP4, please enclose an S.A.E. In the meantime, good sampling!

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